

APPENDIX E. Stormwater basins, ~~and ponds~~ and underdrained filter beds

This appendix applies to all projects using stormwater basins, ~~or ponds~~ or underdrained filters, and outlines the criteria for siting, designing, and constructing detention basins and ponds used for meeting the department's stormwater management rules. The department may require additional measures based ~~on~~ regarding geotechnical, hydrologic, structural, hydraulic, and construction concerns. For example, the department may require that the designer assess the impoundment's hazard potential for determining the appropriate design storm for the impoundment because the design storm may have a greater rainfall depth and larger recurrence interval than the 25-year, 24-hour storm used for the department's stormwater management program.

1. **Basin and pond types.** A variety of stormwater management basins and ponds are used to control runoff quantity and improve runoff quality from developments. All need professional siting and design to avoid unreasonable impacts to wetlands, surface waters, and groundwater and to ensure long-term stability, pollutant removal performance, and control of peak flow rates. General restrictions and requirements for all basins and ponds are provided below.

NOTE Specific siting and design criteria for each type of structure can be found in the department's manual "Stormwater Management for Maine: Best Management Practices"

2. **Siting restrictions.** The department has placed the following general restrictions on the siting of stormwater basins and ponds. Additional restrictions may be required based on drainage, geotechnical, wildlife, and safety concerns.
 - (a) **Rivers, streams and brooks.** A basin or pond may not be located in or adjacent to a river, stream, or brook (intermittent or perennial) unless approved by the department pursuant to, or exempted from, the Natural Resources Protection Act (NRPA). For the purposes of this appendix, "adjacent to" is defined as in Chapter 305.
 - (b) **Wetlands.** A basin or pond may not be constructed in or adjacent to a wetland and no dam, wall, berm, or embankment may be placed within or adjacent to a wetland as part of a stormwater management system, unless approved by the department pursuant to the NRPA. The use of natural wetlands for runoff detention or retention storage to meet the general, phosphorus, flooding, or other standards in this chapter is prohibited unless the flooding standards in Section 4(D) are met and a Natural Resources Protection Act permit is obtained if required.
 - (c) **Discharge of flows.** Concentrated flows from stormwater basins and ponds may not be discharged to an off-site area that has not received concentrated flows before. When detention is used on a site, the pre-construction flow condition to off-site areas, whether sheet or concentrated, must be maintained in the post-construction condition unless drainage easements are obtained from affected property owners.
 - (d) **Underground detention.** Where underground detention is required because of limited space or other restrictions, runoff must at a minimum receive treatment to remove sediment and debris ~~be treated to at least a low level of stormwater treatment prior to the runoff's discharge to the underground storage facility~~. The department may require runoff treatment to remove other

pollutants if it determines that underground storage poses a threat to groundwater quality in which case all requirements in Appendix D must be met. The outlet control structure and the storage chambers for the underground detention structure must be accessible from the surface for maintenance, debris removal, and, if necessary, future modification.

3. Pond and basin ~~D~~ design requirements

- (a) **Principal spillways** Basins and ponds designed to control flows so as to meet the flooding standard must have principal spillways capable of controlling runoff from 24-hour storms of the 2-year, 10-year, and 25-year frequencies. Basins and ponds designed to provide channel protection detention must have principal spillways capable of providing extended detention of twelve hours for runoff from a 24-hour storm of a one-year frequency. In both cases, the principal spillway must control the maximum flows from the design storm(s) without activating the emergency spillway.
 - (i) **Trash racks** Any pipe, orifice, or culvert serving as a basin or pond outlet must have a trash rack to control clogging by debris and to provide safety to the public. The surface area of each rack must be at least four times the outlet opening it is protecting. A significantly larger trash rack areas-ratio ~~may~~ be required for openings less than twenty-four inches in diameter. The spacing between rack bars must be no more than six inches or one-half the dimension of the smallest outlet opening behind it, whichever is less. If possible, trash racks should be inclined so to be self-cleaning.
 - (ii) **Seepage controls** All smooth outlet pipes greater than eight inches and all corrugated outlet pipes greater than 12 inches must have seepage controls to prevent the piping of soil along the outside of the pipe. This standard applies to both dry detention basins and ponds with permanent pools.
 - (iii) **Anti-floatation design** All outlets employing a riser structure must be designed to prevent the riser floating.
- (b) **Emergency spillways** Each stormwater basin and pond must have an emergency spillway designed to independently convey the routed runoff from at least the 25-year, 24-hour storm ~~while maintaining at least one foot of freeboard between the peak storage elevation and the top of the embankment crest~~ (as described under 3(c)(i) Crest elevation). All spillways must meet the following criteria:
 - (i) **Location** Emergency spillways must be located on undisturbed, non-fill soil wherever possible. If the spillway must be located on fill soils, then the spillway must be horizontally offset at least 20 feet from the principal outlet and be designed with a riprap lining, reinforced-turf lining, or a non-flexible lining.
 - (ii) **Exit channel grade** The maximum grade of the spillway's exit channel may not exceed 20% unless a non-flexible lining is used to control erosion within the channel. Vegetation, reinforced turf, riprap, and modular blocks are considered flexible linings. All linings must be evaluated for stability at the channel grade chosen.

(iii) **Flow depth** The design flow depth in the exit channel may not exceed one-half the d50 stone size for channels lined with riprap. The design flow depth in the exit channel may not exceed three inches for channels lined with un-reinforced vegetation.

(c) **Embankments** Basin and pond embankments must be designed by a professional engineer registered in the State of Maine. The design must include an investigation of the subsurface conditions at the proposed embankment location to evaluate settlement potential, groundwater impacts, and the need for seepage controls. The department will require the submittal of a geotechnical report from a geotechnical engineer for any embankment over 10 feet in effective height or posing a significant hazard to downstream property or life.

(i) **Crest elevation** The minimum elevation of the top of the settled embankment must be at least one foot above the peak water surface in the basin with the emergency spillway flowing at design depth for the design storm routed through just the emergency spillway.

(ii) **Crest width** The minimum crest width for any embankment must be as shown in the following table:

Effective height of embankment (feet)	Crest Width (feet)
less than 10	6
10 - 15	8
15 - 20	10
20 - 25	12
25 - 35	14
more than 35	15

(iii) **Construction** The selection of fill materials must be subject to approval of the design engineer or inspecting engineer. Fill must be free of frozen soil, rocks over six inches, and sod, brush, stumps, tree roots, wood, or other perishable materials. Embankment fills less than 10 feet in fill height must be compacted using compaction methods that would reasonably guarantee that the fill density is at least 90% of the maximum density as determined by standard proctor (ASTM-698). All embankment fills more than 10 feet in fill height must be compacted to at least 90% of the maximum density as determined by standard proctor (ASTM-698) and must have their density verified by field density testing.

(iv) **Slopes** The embankment's slopes may not be steeper than 3 horizontal to one vertical.

(d) Gravel outlet with an underdrain The outlet of wetponds discharging directly to a stream must be designed to meet the general standards for channel protection and must be fitted with a gravel outlet with an underdrain.

(i) Pond bench The bed of the gravel outlet must be built on a pond bench having a width of at least eight feet and a length that equivalent to 3 feet per 1000 cubic feet of volume for

channel protection The bench elevation must be set at the permanent pool elevation such that the channel protection volume will be stored between the bench surface elevation and the elevation of the principal spillway's lowest control outlet. The bench must be located at or near the end of the pond furthest from the principal inflow.

(ii) Underdrain pipe The underdrain pipe must be installed down the centerline of the gravel trench. The pipe may be either perforated PVC pipe or corrugated, polyethylene drainage tubing. The slope of the installed underdrain pipe must be 1% or greater.

(iii) Gravel trench A gravel filled trench with a minimum width of 4 feet and a minimum depth of 3 feet must be installed in the pond bench at least 2 feet from the pond side edge of the bench. The underdrain pipe must be bedded in clean, well-graded gravel (MDOT specification 703 22 Type B) extending 24 inches over the top of the drainage pipe, with at least six inches to the sides of the pipe, and six inches below the pipe.

(iv) Underdrain outlet The underdrain outlet must discharge to an area capable of withstanding concentrated flows and saturated conditions without eroding.

4. Underdrained Soil Filter Beds Design Requirements

Underdrained soil filter are designed to provide pollutant removal and channel protection as they provide the slow release of runoff. The filter also provides cooling of the discharge reducing thermal impact to the receiving body of water.

NOTE Specific design criteria for each type of filter bed structure and design can be found in the department's BMP manual "Stormwater Management for Maine."

Bed construction Underdrained soil filter basins designed to meet the general standards for soil filters must be designed to meet the following criteria:

(a) Volume stored and treated The soil filter basin must store and filter at least 1.0 inch of stormwater runoff from the impervious area draining to it and 0.4 inches of stormwater runoff from the landscaped area draining to it. A stable overflow outlet must be provided for stormwater in excess of the volume to be stored for treatment.

(b) Soil filter The soil filter basin must consist of depressional surface storage over a densely vegetated soil filter that is underlain with underdrain bedding and drained by perforated under drain pipe. The soil filter material must be fine enough to filter fine sediments and provide effective adsorption of pollutants, but coarse enough to slowly drain the stored stormwater within a 24 to 48 hour period. The soil filter material must be well blended and graded and must contain sufficient organic matter to facilitate the removal and treatment of hydrocarbons.

(c) Underdrain pipe bedding The interface between the underdrain bedding material and the soil filter material must be designed to minimize the risk of clogging at the interface while preventing significant loss of fine soil material from the soil filter layer. The underdrain bedding material must be sufficiently coarse to allow flow of treated water to the underdrain pipe.

(d) Filter bed design The area and volume of the soil filter must be adequate to provide effective long term treatment of the volume of stormwater to be treated

(e) Underdrain outlet The underdrain system and the overflow must discharge to areas capable of withstanding concentrated flows and saturated conditions without eroding

5. Additional requirements. Additional requirements may be applied on a site-specific basis

~~(d) Underdrained soil filters~~ Dry detention basins designed to meet the BMP standards for soil filters must have underdrains meeting the following criteria:

~~(i) Impoundment depth~~ The peak storage depth within the filter area for the water quality volume may not exceed 18 inches

~~(ii) Pipe layout and spacing~~ Layout of the pipe underdrain system must be sufficient to effectively drain the entire filter area. There must be at least one line of underdrain pipe for every eight feet of the filter area's width. The pipe may be either perforated PVC pipe or corrugated polyethylene drainage tubing. The slope of the installed underdrain pipe must be 1% or greater.

~~(iii) Pipe bedding~~ The underdrain pipes must be bedded in clean, well-graded gravel extending at least 12 inches over the top of the drainage pipe, at least six inches thick to the sides of the drainage pipe, and at least six inches below the drainage pipe.

~~(iv) Filter bed~~ The soil filter must consist of loamy, coarse sand. The soil filter must extend across the bottom of the entire filter area. The soil filter must be at least 18 inches deep and underlain by a gravel bedding (see Appendix E, Section 3(d)(iii) above). The interface between the gravel and soil must be tilled to create a six-inch mixing zone between the two layers.

~~(v) Surface cover~~ The top of the gravel underdrain must be covered with a four-inch layer of sandy loam and then covered with a sod lining consisting of species tolerant of frequent inundation.

~~(vi) Underdrain outlet~~ Each underdrain system must discharge to an area capable of withstanding concentrated flows and saturated conditions without eroding.

~~(e) Underdrained gravel filters~~ Wetponds designed to meet the BMP standards for gravel filters must have underdrains meeting the following criteria:

~~(i) Pond bench~~ The gravel filter must be built on a pond bench having a width of at least eight feet and having a length at least as long as the major axis of the pond. The bench elevation must be set such that the water quality volume will be stored between the bench surface elevation and the elevation of the principal spillway's lowest control outlet.

~~(ii) Pipe layout and spacing~~ The pipe underdrain system must be installed down the centerline of the pond bench. The pipe may be either perforated PVC pipe or corrugated, polyethylene

~~drainage tubing. The pipe must be installed at a depth of at least four feet below the bench surface. The slope of the installed underdrain pipe must be 1% or greater.~~

~~(iii) Gravel bed. The gravel filter must be bedded in clean, well-graded gravel extending at least 12 inches over the top of the drainage pipe, at least six inches to the sides of the drainage pipe, and at least six inches below the drainage pipe.~~

~~(iv) Surface cover. The top of the underdrained filter must be covered with a 3 to 4 inch thick layer of loam with less than 5% of the soil passing through a #200 sieve. This loam layer must be seeded with grass or legume species tolerant of frequent inundation.~~

~~(v) Underdrain outlet. Each underdrain system must discharge to an area capable of withstanding concentrated flows and saturated conditions without eroding.~~

~~4. Additional requirements. Additional requirements may be applied on a site specific basis.~~

APPENDIX F: Vegetated buffers

This appendix applies to all projects using vegetated buffers for stormwater control. A buffer is a vegetated, non-lawn area or areas located down gradient from a project that serves to store and remove pollutants from stormwater runoff flowing from a project. Buffers must not be interrupted by intermittent or perennial stream channels or other drainageways and must have a relatively uniform slope so that stormwater does not concentrate in channels. This appendix describes the design and sizing requirements for vegetated buffers designed to meet the general standards. Requirements are described for four different types of buffers, each of which is appropriate for specific situations.

1. Types of vegetated buffers. The applicability of each of the four types of vegetated buffers is as follows:

~~(a)~~ **Vegetated buffer with stone bermed level lip spreaders.** A vegetated buffer with stone bermed level lip spreaders must be used when treating stormwater runoff from any of the following:

~~(i)~~ **An impervious area greater than one acre,**

~~(ii)~~ **Impervious areas where the flow path across the impervious area exceeds 150 feet, or**

~~(iii)~~ **Developed areas, including lawns and impervious surfaces, where runoff is concentrated, intentionally or unintentionally, so that it does not run off in well-distributed sheet flow when it enters the upper end of a buffer, except that road ditch runoff may be treated using a ditch turn-out buffer.**

~~(b)~~ **Buffer adjacent to the down hill side of a road.** A buffer located along the down hill side of a road may only be used when the runoff from the road surface and shoulder sheets immediately into a buffer. In no instance may runoff from areas other than the adjacent road surface and shoulder be directed to these buffers.

~~(c)~~ **Ditch turn-out buffer.** A ditch turn-out buffer may only be used when runoff from a road ditch is diverted to a 20-foot stone bermed level lip spreader that distributes runoff into a buffer. No areas other than the road surface, road shoulder and road ditch may be directed into a buffer. No more than 400 ft of road and ditch may be treated in any ditch turn-out buffer, and no more than 250 feet may be treated if more than one travel lane is draining to the ditch.

~~(d)~~ **Buffer adjacent to residential, largely pervious or small impervious areas.** A buffer adjacent to a residential, largely pervious or small impervious area that does not require that runoff be distributed by means of a level spreader may only be used when:

~~(i)~~ **A buffer is located immediately downhill of the developed area, and**

~~(ii)~~ **Runoff from the developed area is not concentrated and enters a buffer in well distributed sheet flow.**

Only runoff from the following areas may be treated using this type buffer:

~~(iii)~~ **A single family residential lot,**

~~(xii)(iv)~~ A developed area with less than 10% imperviousness where the flow path over the portion of the developed area for which treatment is being credited does not exceed 150 feet, or

~~(xii)(v)~~ An impervious area of less than one acre, where the flow path across the impervious area does not exceed 100 feet

~~(xiii)2.~~ Design requirements for all buffer types. The following design requirements apply to all types of buffers

- (a) Topography. The topography of a buffer area must be such that stormwater runoff will not concentrate as it flows across a buffer, but will remain well-distributed. Flow paths of runoff through a buffer must not converge, but must be essentially parallel or diverging.
- (b) Vegetative cover. The vegetative cover type of a buffer must be either forest or meadow. In most instances the sizing of a buffer varies depending on vegetative cover type.

(i) Forest buffer. A forest buffer must have a well-distributed stand of trees with essentially complete canopy cover, and must be maintained as such. A forested buffer must also have an undisturbed layer of duff covering the mineral soil. Activities that may result in disturbance of the duff layer are prohibited in a buffer.

~~(i)(ii)~~ Meadow buffer. A meadow buffer must have a dense cover of grasses, or a combination of grasses and shrubs or trees. A buffer must be maintained as a meadow with a generally tall stand of grass, not as a lawn. It must not be mown more than twice per calendar year. If a buffer is not located on natural soils, but is constructed on fill or reshaped slopes, a buffer surface must either be isolated from stormwater discharge until a dense sod is established, or must be protected by a three inch layer of erosion control mix or other woodwaste material approved by the department before stormwater is directed to it, with vegetation must be established using an appropriate seed mix.

~~(i)(iii)~~ Mixed meadow and forest buffer. If a buffer is part meadow and part forest, the required sizing of a buffer must be determined as a weighted average, based on the percent of a buffer in meadow and the percent in forest, of the required sizing for meadow and forest buffers.

- (c) Deed restrictions and covenants. Areas designated as vegetated buffers must be clearly identified on site plans and protected from disturbance by deed restrictions and covenants.

3. Design specifications and sizing tables for a vegetated buffer with stone bermed level lip spreaders. Stormwater runoff must be delivered to a vegetated buffer with stone bermed level lip spreaders in either sheet or concentrated flow. These design specifications direct runoff behind a stone berm constructed along the contour at the upper margin of a buffer area. As a result of restriction of flow through the berm, the runoff then spreads out behind the berm so that it seeps through the entire length of the berm and is evenly distributed across the top of a buffer. The stone must be coarse enough that it will not clog with sediment. The berm must be well-graded and contain some small stone and gravel so that flow through the berm will be restricted enough to cause it to spread out behind the berm.

- (a) **Stone berm specifications** The stone berm must be at least 1.5 feet high and 2.0 feet across the top with 2:1 side slopes constructed along the contour and closed at the ends. Unless otherwise approved by the department, the design must include a shallow, 6-inch deep trapezoidal trough with a minimum bottom width of three feet, and with a level downhill edge excavated along the contour on the uphill edge of the stone berm. Stone for stone bermed level lip spreaders must consist of sound durable rock that will not disintegrate by exposure to water or weather. Fieldstone, rough quarried stone, blasted ledge rock or tailings may be used. The rock must be well-graded within the following limits, or as otherwise approved by the department:

Sieve Designation (Metric)	Sieve Designation (US Customary)	Percent by Weight passing Square Mesh Sieves
300 mm	12 in	100
150 mm	6 in	84-100
75 mm	3 in	68-83
25.4 mm	1 in	42-55
4.75 mm	No. 4	8-12

- (b) **Buffer sizing** The required size of a buffer area below the stone bermed level lip spreader varies with the size and imperviousness of the developed area draining to a buffer, the type of soil in a buffer area, the slope of a buffer, and the vegetative cover type. The following table indicates the required berm length per acre of impervious area and lawn draining to a buffer for a given length of flow path through a buffer. Required berm length varies by the Hydrologic Soil Group of the soils in a buffer and by the length of flow path through a buffer. If more than one soil type is found in a buffer, the required sizing of a buffer must be determined as weighted average, based on the percent of a buffer in each soil type, of the required sizing for each soil type buffer. Alternative sizing may be allowed if it is determined by a site specific hydrologic buffer design model approved by the department. A buffer meeting this standard is not allowed on Hydrologic Soil Group D soils that are identified as wetland soils. A buffer meeting this standard is not allowed on natural slopes in excess of 15% unless a buffer has been evaluated using a site specific hydrologic buffer design model approved by the department, and measures have been included to ensure that runoff remains well-distributed as it passes through a buffer.

The table below applies to a buffer with slopes ranging from 0 to 8%. For a buffer with slopes between 9% and 15%, the indicated berm length must be increased by 20%.

NOTE The following tables were developed using a 1.25 inch, 24 hour storm of type III distribution, giving a maximum unit flow rate of less than 0.009 cfs per foot.

Required berm and flow length of buffer with 0-8% slope and a stone bermed level lip spreader

Hydrologic Soil Group	Length of flow path through buffer (feet)	Berm length for a forested buffer (feet)		Berm length for a meadow buffer (feet)	
		Per acre of impervious area	Per acre of lawn	Per acre of impervious area	Per acre of lawn
Soil Group A	75	75	25	125	35
	100	65	20	75	25
	150	50	15	60	20
Soil Group B	75	100	30	150	45
	100	80	25	100	30
	150	65	20	75	25
Soil Group C, sandy loam or loamy sand	75	125	35	150	45
	100	100	30	125	35
	150	75	25	100	30
Soil Group C, silt loam, clay loam or silty clay loam	100	150	45	200	60
	150	100	30	150	45
Soil Group D, non-wetland	150	150	45	200	60

4. **Design specifications and sizing tables for a buffer adjacent to the down hill side of a road.** A buffer adjacent to the down hill side of a road may only be used when a buffer is located such that the runoff from the road surface and shoulder sheets immediately into a buffer. Required buffer design and sizing for this type of buffer does not vary with soil type or slope, except that a buffer meeting this standard is not allowed on soils identified as wetland soils or on natural slopes in excess of 20%. Sizing depends on the vegetative cover type of a buffer and the number of travel lanes draining to a buffer as indicated in the following table

	Length of flow path for a forested buffer (feet)	Length of flow path for a meadow buffer (feet)
One travel lane draining to buffer	35	50
Two travel lanes draining to buffer	55	80

The inslope of the road bed may be included as part of a meadow buffer only if it is designed and constructed to allow infiltration. Design and construction to allow infiltration includes, but is not limited to, the inslope fill material having slopes no steeper than 3:1, loaming and seeding to meadow grasses, and maintaining a buffer area as a meadow buffer.

5. **Design specifications and sizing tables for a ditch turn-out buffer.** A ditch turn-out buffer may only be used when runoff from a road ditch is diverted to a 20-foot stone bermed level lip spreader that distributes runoff into a buffer. No areas other than the road surface, road shoulder, road ditch, and ditch back slopes may be directed to the stone bermed level lip spreader.
 - (a) **Stone berm specifications.** The stone berm to which the ditch turn-out delivers the runoff must be at least 20 feet in length and must be constructed along the contour. It must be at least one-foot high and two feet across the top with 2:1 side slopes. Stone for the berm must consist of sound durable rock that will not disintegrate by exposure to water or weather. Fieldstone, rough quarried stone, blasted ledge rock or tailings may be used. The rock must be well-graded with a median size of approximately 3 inches and a maximum size of 6 inches.
 - (b) **Buffer sizing.** The required size of a buffer area below the stone bermed level lip spreader varies with the type of soil in a buffer area, the slope of a buffer, the length of road ditch draining to a buffer and the vegetative cover type within a buffer. A buffer meeting this standard is not allowed on Hydrologic Soil Group D soils or on slopes in excess of 15%. The following table indicates the required length of the flow path through a buffer for various vegetative covers and ditch lengths. The tables below apply to a buffer with slopes ranging from 0 to 8%. For a buffer with slopes between 9% and 15%, the indicated length of flow path should be increased by 20%. If two travel lanes drain to the ditch, as in the case of a super elevated road, the length of flow path indicated for 400 feet of road must be used, but no more than 250 feet of ditch may drain to each turn-out.

Required length of flow path per length of road or ditch draining to a buffer

Hydrologic soil group of soil in buffer	Length of road or ditch draining to a buffer (feet)	Length of flow path for a forested buffer (feet)	Length of flow path for a meadow buffer (feet)
A	200	50	70
	300	50	85
	400	60	100
B	200	50	70
	300	50	85
	400	60	100
C Loamy Sand or Sandy Loam	200	60	100
	300	75	120
	400	100	Not applicable
C Silt Loam, Clay Loam, or Silty Clay Loam	200	75	120
	300	100	Not applicable
D Non-wetland	200	100	150

6. Design specifications and sizing tables for a buffer adjacent to a residential lot; developed area with less than 10% imperviousness, where the flow path over the portion of the developed area for which treatment is being credited does not exceed 150 feet; or an impervious area where the flow path across the impervious area does not exceed 100 feet. The design specifications and sizing tables below may only be used when a buffer is located immediately adjacent to the downhill side of a developed area, and where the topography and structures within the developed area do not cause any significant concentration of runoff

This design is appropriate for residential lots and other mostly pervious areas with relatively uniform topography and for small impervious areas. This design is not appropriate for treating large impervious areas because, even if pavement is graded evenly, it is likely that some concentration of runoff will occur as the stormwater travels across large areas of pavement. For large areas of pavement where the average path of flow across the pavement exceeds 100 feet, or where runoff will not be evenly distributed across the downhill edge of the pavement, a stone bermed level lip spreader must be used and the berm and buffer must be sized according to the specifications in Section 3 above.

The table below indicates the required minimum length of the flow path through a buffer for various soil types and vegetative cover types. Length of flow paths defined in this table apply to buffers with slopes between 0 and 8%. For buffers with slopes between 9% and 15%, the indicated length of flow path must be increased by 20%. A buffer meeting this standard is not allowed on slopes in excess of 15% or Hydrologic Soil Group D soils except that a forested buffer is allowed if the D soils in a buffer are not wetland soils. Buffers described by this section must be located downhill of the entire

developed area for which it is providing stormwater treatment, such that all runoff from the entire developed area has a flow path through a buffer at least as long as the required length of flow path

Required minimum length of the flow path through a buffer for various soil types and vegetative cover types

Hydrologic soil group of soil in buffer	Length of flow path for a forested buffer (feet)	Length of flow path for a meadow buffer (feet)
A	45	75
B	60	85
C Loamy Sand or Sandy Loam	75	100
C Silt Loam, Clay Loam, or Silty Clay Loam	100	150
D Non-wetland	150	Not applicable

APPENDIX C. Suggested templates for deed restrictions and conservation easements for use under the Stormwater Management Law

1. Forested buffer, limited disturbance

DECLARATION OF RESTRICTIONS (Forested Buffer, Limited Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____ day of _____,
20____, by _____, _____
(name) (street address)

(name)

(street address)

_____, _____ County, Maine, _____, (herein referred to as the
(city or town) (county) (zip code)

"Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under the Stormwater Management Law, to preserve a buffer area on a parcel of land near

(road name) (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(town)

described in a deed from _____ to _____ dated _____
(name) (name of Declarant)

_____, 20____, and recorded in Book ____ Page ____ at the _____ County
Registry of Deeds, herein referred to as the "property", and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows (Note Insert description of restricted buffer area location here)

WHEREAS, pursuant to the Stormwater Management Law, 38 M.R.S.A. Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein; and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

- 1 **Restrictions on Restricted Buffer Area** Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows:

- a No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material may be placed, stored or dumped on the Restricted Buffer Area, nor may the topography of the area be altered or manipulated in any way,
- b Any removal of trees or other vegetation within the Restricted Buffer Area must be limited to the following:
 - (i) No purposefully cleared openings may be created and an evenly distributed stand of trees and other vegetation must be maintained. An "evenly distributed stand of trees" is defined as maintaining a minimum rating score of 24 points in any 25 foot by 50 foot square (2500 square feet) area, as determined by the following rating scheme:

Diameter of tree at 4 1/2 feet above ground level	Points
2 - 4 inches	1
4 - 8 inches	2
8 - 12 inches	4
>12 inches	8

Where existing trees and other vegetation result in a rating score less than 24 points, no trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained,

- (ii) No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;
- c No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence,
- d No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area,
- e Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

- 2 Enforcement The MDEP may enforce any of the Restrictions set forth in Section 1 above
- 3 Binding Effect. The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.
- 4 Amendment Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.
- 5 Effective Provisions of Declaration Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.
- 6 Severability Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.
- 7 Governing Law This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

(NAME)

(NAME)

STATE OF MAINE

_____, County, _____, 20____
(County) (date)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

Notary Public

2. Forested buffer, no disturbance

DECLARATION OF RESTRICTIONS (Forested Buffer, No Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____ day of _____, 20____,
by _____,
(name) (street address)

_____, _____ County, Maine, _____, (herein referred to as the
(city or town) (county) (zip code)
"Declarant", pursuant to a permit received from the Maine Department of Environmental Protection
under the Stormwater Management Law, to preserve a buffer area on a parcel of land near
_____,
(road name) (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(town)
described in a deed from _____ to _____, dated
(name) (name of Declarant)
_____, 20____, and recorded in Book _____ Page _____ at the _____ County
Registry of Deeds, herein referred to as the "property", and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a
portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows
(Note Insert description of restricted buffer location here)

WHEREAS, pursuant to the Stormwater Management Law, 38 M R S A Section 420-D and Chapter 500
of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management
Rules"), Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more
particularly set forth herein and has agreed that these restrictions may be enforced by the Maine
Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever
be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions
set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all
parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and
their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of
the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or

part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth

- 1 **Restrictions on Restricted Buffer Area.** Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows
 - a No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor shall the topography of the area be altered or manipulated in any way,
 - b No trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained,
 - c No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area,
 - d No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence,
 - e No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area,
 - f Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

- 2 **Enforcement.** The MDEP may enforce any of the Restrictions set forth in Section 1 above.
- 3 **Binding Effect.** The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.

- 4 **Amendment** Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP
- 5 **Effective Provisions of Declaration** Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area
- 6 **Severability** Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration
- 7 **Governing Law** This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

(NAME)

STATE OF MAINE, _____ County, dated _____, 20____
(County)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed

Notary Public

3. Meadow buffer

DECLARATION OF RESTRICTIONS

(Non-Wooded Meadow Buffer)

THIS DECLARATION OF RESTRICTIONS is made this _____ day of _____, 20____, by

_____, _____
(name) (street address)

_____, _____ County, Maine, _____, (herein referred to as the
(city or town) (county) (zip code)

"Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under the Stormwater Management Law, to preserve a buffer area on a parcel of land near

_____, _____
(road name) (known feature and/or town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(town)

described in a deed from _____ to _____, dated
(name) (name of Declarant)

_____, 20____, and recorded in Book _____ Page _____ at the _____ County
Registry of Deeds, herein referred to as the "property", and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows
(Note Insert description of restricted buffer location here)

WHEREAS, pursuant to the Stormwater Management Law, 38 M R S A Section 420-D and Chapter 500 of rules promulgated by the Maine Board of Environmental Protection ("Stormwater Management Rules"), Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the

Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth

1. **Restrictions on Restricted Buffer Area.** Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows
 - a No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor may the topography or the natural mineral soil of the area be altered or manipulated in any way,
 - b A dense cover of grassy vegetation must be maintained over the Restricted Buffer Area, except that shrubs, trees and other woody vegetation may also be planted or allowed to grow in the area The Restricted Buffer Area may not be maintained as a lawn or used as a pasture If vegetation in the Restricted Buffer Area is mowed, it may be mown no more than two times per year
 - c No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence,
 - d No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area, except for vehicles used in mowing,
 - e Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided

2. **Enforcement** The MDEP may enforce any of the Restrictions set forth in Section 1 above
3. **Binding Effect** The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property
4. **Amendment** Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP

- 5 **Effective Provisions of Declaration** Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area
- 6 **Severability** Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration
- 7 **Governing Law** This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine

(NAME)

STATE OF MAINE, _____, County, dated _____, 20____
(County)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed

Notary Public

AUTHORITY.	38 M R S A §§ 341-D, 413, 420-D, and 484
EFFECTIVE DATE	December 31, 1997
REPEALED AND REPLACED	October 31, 2005, filing 2005-417
<u>AMENDED</u>	